Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

NATIONAL QUALITY MEASURES CLEARINGHOUSE

General

Title

End stage renal disease (ESRD): percentage of end-stage renal disease (ESRD) patients aged 18 years and older receiving hemodialysis during the 12-month reporting period and on dialysis for greater than 90 days who 1) have a functional AVF, or 2) have a functional AVG, or 3) have a catheter but have been seen/evaluated for a functional autogenous AVF or AVG at least once during the 12–month reporting period.

Source(s)

Kidney Care Quality Alliance (KCQA). KCQA NQF-endorsed performance measure technical specifications. Washington (DC): Kidney Care Quality Alliance (KCQA); 2015 May 19. 1 p.

Measure Domain

Primary Measure Domain

Clinical Quality Measures: Process

Secondary Measure Domain

Does not apply to this measure

Brief Abstract

Description

This measure is used to assess the percentage of end stage renal disease (ESRD) patients aged 18 years and older receiving hemodialysis during the 12-month reporting period and on dialysis greater than 90 days who:

> Have a functional arteriovenous fistula (AVF) (defined as two needles used or single-needle device [NOT one needle used in a two-needle device]) (computed and reported separately); or
> Have a functional arteriovenous graft (AVG) (computed and reported separately); or
> Have a catheter but have been seen/evaluated by a vascular surgeon, other surgeon qualified in the area of vascular access, or interventional nephrologist trained in the primary placement of vascular access for a functional autogenous AVF or AVG at least once during the 12-month reporting period (computed and reported separately).

Rationale

The intent of the measure is to reduce the frequency of vascular access-related complications and improve patient survival by promoting arteriovenous fistula (AVF) and/or arteriovenous graft (AVG) placement and discouraging central venous catheter (CVC) use.

Research has clearly and consistently illustrated the net benefit of the use of permanent vascular access types over central venous catheters; studies cited demonstrate a graded morbidity and mortality risk dependent on vascular access type in hemodialysis patients, with catheters carrying the highest risk, followed by AV grafts, then AVFs.

As noted in the Kidney Dialysis Outcome and Quality Initiative's (KDOQI) Clinical Practice Guidelines and Recommendations for Vascular Access (National Kidney Foundation, 2006), AVFs are preferred over all other forms of access because of their functional advantages and lower complications rates. Specifically, AVFs have the lowest rate of thrombosis (Perera et al., 2004) and require the fewest interventions (Perera et al., 2004; Huber et al., 2003), and thus provide longer survival of the access (Perera et al., 2004; Huber et al., 2003; Pisoni et al., 2002; Mehta, 1991). The number of access events is three- to seven-fold greater in prosthetic bridge grafts than in native AVFs (Perera et al., 2004; Huber et al., 2003; Mehta, 1991). As a result, costs of implantation and access maintenance are the lowest for AVFs (Mehta, 1991; National Institutes of Health [NIH] & National Institute of Diabetes and Digestive and Kidney Diseases [NIDDKD], 1995; Egger & Milam, 2001). Moreover, vascular access infections in hemodialysis patients are common, can be severe, and contribute to infection being the second leading cause of death in patients with chronic kidney disease (CKD) stage 5 (Gulati et al., 2003). AVFs have been demonstrated to have lower rates of infection than grafts, which, in turn, are less prone to infection than percutaneous catheters and subcutaneous port catheter systems (Nassar & Ayus, 2001). Consequently, AVFs are associated with increased survival and lower hospitalization rates than either AVGs or catheters (Dhingra et al., 2001). Research indicates that patients dialyzed via catheters and grafts have a greater mortality risk (relative risk = 2.3 and 1.47, respectively) than patients dialyzed with AVFs (Dhingra et al., 2001), and epidemiological evidence confirms that greater use of AVFs reduces morbidity and mortality (Dhingra et al., 2001; Woods & Port, 1997; Xue et al., 2003; Polkinghorne et al., 2004).

Evidence for Rationale

Dhingra RK, Young EW, Hulbert-Shearon TE, Leavey SF, Port FK. Type of vascular access and mortality in U.S. hemodialysis patients. Kidney Int. 2001 Oct;60(4):1443-51. PubMed

Eggers P, Milam R. Trends in vascular access procedures and expenditures in Medicareâ€™s ESRD program. In: Henry ML, editor(s). Vascular access for hemodialysis-VII. Chicago (IL): Gore; 2001. p. 133-43.

Gulati S, Sahu KM, Avula S, Sharma RK, Ayyagiri A, Pandey CM. Role of vascular access as a risk factor for infections in hemodialysis. Ren Fail. 2003 Nov;25(6):967-73. PubMed

Huber TS, Carter JW, Carter RL, Seeger JM. Patency of autogenous and polytetrafluoroethylene upper extremity arteriovenous hemodialysis accesses: a systematic review. J Vasc Surg. 2003 Nov;38(5):1005-11. PubMed

Mehta S. Statistical summary of clinical results of vascular access procedures for hemodialysis. In: Sommer BG, Henry ML, editor(s). Vascular access for hemodialysis--II. 2 ed. Chicago (IL): WL Gore & Associates and Precept Press; 1991. p. 145-57.

Nassar GM, Ayus JC. Infectious complications of the hemodialysis access. Kidney Int. 2001 Jul;60(1):1-13. PubMed

National Institutes of Health (NIH), National Institute of Diabetes and Digestive and Kidney Diseases (NIDDKD). The cost effectiveness of alternative types of vascular access and the economic cost of ESRD. Bethesda (MD): National Institutes of Health (NIH); 1995. 139-57 p.

National Kidney Foundation. KDOQI clinical practice guidelines and clinical practice recommendations for 2006 updates: hemodialysis adequacy, peritoneal dialysis adequacy and vascular access. Am J Kidney Dis. 2006 Jul;48(Suppl 1):S1-322.

Perera GB, Mueller MP, Kubaska SM, Wilson SE, Lawrence PF, Fujitani RM. Superiority of autogenous arteriovenous hemodialysis access: maintenance of function with fewer secondary interventions. Ann Vasc Surg. 2004 Jan;18(1):66-73. PubMed

Pisoni RL, Young EW, Dykstra DM, Greenwood RN, Hecking E, Gillespie B, Wolfe RA, Goodkin DA, Held PJ. Vascular access use in Europe and the United States: results from the DOPPS. Kidney Int. 2002 Jan;61(1):305-16. PubMed

Polkinghorne KR, McDonald SP, Atkins RC, Kerr PG. Vascular access and all-cause mortality: a propensity score analysis. J Am Soc Nephrol. 2004 Feb;15(2):477-86. PubMed

Woods JD, Port FK. The impact of vascular access for haemodialysis on patient morbidity and mortality. Nephrol Dial Transplant. 1997 Apr;12(4):657-9. PubMed

Xue JL, Dahl D, Ebben JP, Collins AJ. The association of initial hemodialysis access type with mortality outcomes in elderly Medicare ESRD patients. Am J Kidney Dis. 2003 Nov;42(5):1013-9. PubMed

Primary Health Components

End stage renal disease (ERSD); hemodialysis; vascular access; autogenous arteriovenous fistula (AVF); arteriovenous graft (AVG); evaluation for vascular access

Denominator Description

All end stage renal disease (ESRD) patients aged 18 years and older receiving hemodialysis during the 12-month reporting period and on dialysis for greater than 90 days (see the related "Denominator Inclusions/ Exclusions" field)

Numerator Description

Number of patients from the denominator who:

- Have a functional arteriovenous fistula (AVF) (defined as two needles used or single-needle device [NOT one needle used in a two-needle device]); or
- Have a functional arteriovenous graft (AVG); or
- Have a catheter but have been seen/evaluated by a vascular surgeon, other surgeon qualified in the area of vascular access, or interventional nephrologist trained in the primary placement of vascular access for a functional autogenous AVF or AVG at least once during the 12-month reporting period

Evidence Supporting the Measure

Type of Evidence Supporting the Criterion of Quality for the Measure

A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence

A systematic review of the clinical research literature (e.g., Cochrane Review)

One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

Additional Information Supporting Need for the Measure

Unspecified

Extent of Measure Testing

The Kidney Care Quality Alliance (KCQA) Vascular Access Measure was tested for reliability, validity, and feasibility at both dialysis facilities and within physician offices.

Facility Testing
KCQA tested its end-stage renal disease (ESRD) measures through a one-year prospective cohort study on a nationally drawn sample of 53 dialysis facilities containing a mix of for-profit and not-for-profit providers; hospital-affiliated and freestanding facilities within large, small, and independent dialysis organizations; urban, suburban, and rural settings; and facilities both with and without electronic health records (EHRs). Facility samples were structured to be generally representative of the national industry profile as identified by the United States Renal Data Systems (USRDS) 2007 Annual Data Report.

Approximately 25 patients per facility were sought, resulting in a final sample size of 1,115 patients. Of these, 1,057 were hemodialysis patients and were thus included in the vascular access measures' denominator populations. Patient samples were structured to be generally representative of the national industry profile as identified by the USRDS 2007 Annual Data Report.

Following the data collection period, on-site data-integrity audits were performed at 11 of the 53 facilities (21%). Audit sites were selected to provide a cross-section of facilities reflective of the sample profile. Selection criteria included geographic location, facility type (e.g., for-profit vs. not-for-profit, urban vs. rural), and EHR use. Pertinent data were re-abstracted from the patients' medical records and were compared to the information submitted by the facility throughout the pilot to assess the measure's reliability.

Inter-rater reliability was assessed during the on-site audits through a direct comparison of data submitted by the facilities throughout the pilot to data re-abstracted by the auditor(s). Reliability was quantitatively summarized using Cohen's Kappa with confidence intervals. The resulting Kappa statistic for the Functional AVF or Evaluation by Vascular Surgeon for Placement Measure was found to be 0.8880 with a 95% confidence interval of 0.7484 to 1.000. Based on the literature, this value indicates "almost perfect agreement" and excellent reproducibility for the measure. In addition to the Kappa value, the percent agreement between the auditor and facility abstractors (i.e., the reliability percentage) was calculated and was found to be excellent at 96.9%. These two values demonstrate that the KCQA measure is reliable.

Physician Office Testing
To test the measure in physician offices, Kidney Care Partners (KCP) contracted with the Iowa Foundation for Medical Care (IFMC) to perform on-site testing at four nephrology practice sites distributed geographically across the United States (Iowa, Nevada, Texas, and Pennsylvania) of various practice sizes (5.25 to 62 physicians), and medical record types (two EHR, one paper but by the time of visit transitioning to EHR, and one hybrid).

Each site was asked to pull in advance the records of the first 35 adult hemodialysis patients seen on or after July 1, 2007; IFMC requested an oversample of five patients per site in an effort to ensure a remaining sample of 30 patients. The facilities within which the sample patients received care were asked

to pull the records in advance of the IFMC visit because had previously identified the need for both patient's physician office and dialysis organization records to collect necessary data elements. Physician offices were, therefore, requested to secure copies of the necessary facility records in advance of the IFMC visit.

The four nephrology office sites were visited by a two-person IFMC abstractor team to conduct reliability testing. Using the KCQA data collection tool, the two abstractors individually abstracted each medical record, compared the results, and evaluated the mismatches. Mismatch codes, previously developed by IFMC for reliability testing of project abstraction, were used to classify the reason determined for each mismatch.

Inter-rater reliability was also assessed by IFMC in the physician office setting. As in the facility setting, the resulting Kappa statistic indicates excellent reproducibility at 0.9152 with a 95% confidence interval of 0.8349 to 0.9964.

Evidence for Extent of Measure Testing

Landis JR, Koch GG. The measurement of observer agreement for categorical data. Biometrics. 1977 Mar;33(1):159-74. PubMed

State of Use of the Measure

State of Use

Current routine use

Current Use

not defined yet

Application of the Measure in its Current Use

Measurement Setting

Ambulatory/Office-based Care

Ambulatory Procedure/Imaging Center

Hospital Outpatient

Professionals Involved in Delivery of Health Services

not defined yet

Least Aggregated Level of Services Delivery Addressed

Individual Clinicians or Public Health Professionals

Statement of Acceptable Minimum Sample Size

Unspecified

Target Population Age

Age greater than or equal to 18 years

Target Population Gender

Either male or female

National Strategy for Quality Improvement in Health Care

National Quality Strategy Aim

Better Care

National Quality Strategy Priority

Prevention and Treatment of Leading Causes of Mortality

Institute of Medicine (IOM) National Health Care Quality Report Categories

IOM Care Need

Living with Illness

IOM Domain

Effectiveness

Data Collection for the Measure

Case Finding Period

12 month reporting period

Denominator Sampling Frame

Patients associated with provider

Denominator (Index) Event or Characteristic

Clinical Condition

Patient/Individual (Consumer) Characteristic

Therapeutic Intervention

Denominator Time Window

not defined yet

Denominator Inclusions/Exclusions

Inclusions
All end stage renal disease (ESRD) patients aged 18 years and older receiving hemodialysis during the 12-month reporting period and on dialysis greater than 90 days

Note: This measure includes both in-center and home hemodialysis patients.

Exclusions
None

Exclusions/Exceptions

not defined yet

Numerator Inclusions/Exclusions

Inclusions
Number of patients from the denominator who:

- Have a functional arteriovenous fistula (AVF) (defined as two needles used or single-needle device [NOT one needle used in a two-needle device]); or
- Have a functional arteriovenous graft (AVG); or
- Have a catheter but have been seen/evaluated by a vascular surgeon, other surgeon qualified in the area of vascular access, or interventional nephrologist trained in the primary placement of vascular access for a functional autogenous AVF or AVG at least once during the 12-month reporting period

Exclusions
None

Numerator Search Strategy

Fixed time period or point in time

Data Source

Administrative clinical data

Electronic health/medical record

Paper medical record

Type of Health State

Does not apply to this measure

Instruments Used and/or Associated with the Measure

Unspecified

Computation of the Measure

Measure Specifies Disaggregation

Does not apply to this measure

Scoring

Rate/Proportion

Interpretation of Score

Desired value is a higher score

Allowance for Patient or Population Factors

not defined yet

Standard of Comparison

not defined yet

Identifying Information

Original Title

NQF 0251: Functional arteriovenous fistula (AVF) or AV graft or evaluation for placement.

Measure Collection Name

End Stage Renal Disease (ESRD) Performance Measures

Submitter

Kidney Care Quality Alliance - Clinical Specialty Collaboration

Developer

Kidney Care Quality Alliance - Clinical Specialty Collaboration

Funding Source(s)

Kidney Care Partners

Composition of the Group that Developed the Measure

Kidney Care Quality Alliance Steering Committee Members:

Raymond M. Hakim, MD, PhD (*Co-Chair*)—Fresenius Medical Care
Gail S. Wick, BSN, RN, CNN (*Co-Chair*)—American Nephrology Nurses Association
Dolph Chianchiano, JD—National Kidney Foundation
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Barbara Fivush, MD—American Society of Pediatric Nephrology
Maureen Michael, BSN, MBA—National Renal Administrators Association
Allen Nissenson, MD—DaVita
Barry M. Straube, MD—Centers for Medicare and Medicaid Services (Liaison Member)

Financial Disclosures/Other Potential Conflicts of Interest

None

Endorser

National Quality Forum - None

NQF Number

not defined yet

Date of Endorsement

2015 Jun 12

Adaptation

This measure was not adapted from another source.

Date of Most Current Version in NQMC

2015 May

Measure Maintenance

Annually

Date of Next Anticipated Revision

Unspecified

Measure Status

This is the current release of the measure.

This measure updates a previous version: Kidney Care Quality Alliance. KCQA vascular access: functional arteriovenous fistula access or evaluation by vascular surgeon for placement: detailed technical specifications. Washington (DC): Kidney Care Quality Alliance; 2010. 1 p.

The measure developer reaffirmed the currency of this measure in April 2016.

Measure Availability

Source not available electronically.

For more information, contact Kidney Care Partners at 2550 M Street, NW, Washington, DC 20037; Phone: 703-830-9192; Web site: www.kidneycarepartners.com .

NQMC Status

This NQMC summary was completed by ECRI Institute on November 8, 2011. The information was verified by the measure developer on December 8, 2011.

This NQMC summary was updated by ECRI Institute on June 10, 2015. The information was verified by the measure developer on July 13, 2015.

The information was reaffirmed by the measure developer on April 7, 2016.

Copyright Statement

Full measure specifications for the individual measure, "Vascular Access: Functional Arteriovenous Fistula (AVF) or Arteriovenous Graft (AVG) or Evaluation for Placement," are available from the Kidney Care Partners Web Site (www.kidneycarepartners.com). Check the Kidney Care Partners Web Site regularly for the most recent version of the specifications.

Production

Source(s)

Kidney Care Quality Alliance (KCQA). KCQA NQF-endorsed performance measure technical specifications. Washington (DC): Kidney Care Quality Alliance (KCQA); 2015 May 19. 1 p.

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